

IN THE CLAIMS:

1. (currently amended) A collimating device comprising:

a first transparent substrate having a first surface and a second surface, the first transparent substrate having an index of refraction;

a plurality of wave guide structures provided in the first transparent substrate, the plurality of wave guide structures having an index of refraction different than the index of refraction of the first transparent substrate, ~~each wave guide structure having a base associated with the first surface of the first transparent substrate;~~

a second transparent substrate having a first surface and a second surface wherein the first surface of the second transparent substrate is facing the first surface of the first transparent substrate, the second transparent substrate having an index of refraction; and

a plurality of exit control structures provided in the second transparent substrate, the plurality of exit control structures having an index of refraction different than the index of refraction of the second transparent substrate, ~~each exit control structure having a base associated with the first surface of the second transparent substrate;~~

wherein the first surface of the first transparent substrate and the first surface of the second transparent substrate face each other such that each wave guide structure is generally aligned with each exit control structure thereby forming a collimating structure,

wherein light emanating from a first direction facing the second surface of the first transparent substrate travels between the plurality of wave guide structures through the first transparent substrate and is collimated as it exits adjacent collimating structures.

2. (currently amended) The device of claim 1 42 wherein each respective base of the plurality of wave guide structures is contiguous with each respective base of the plurality of exit control structures.

3. (original) The device of claim 1 wherein the generally aligned wave guide and exit control structures are spaced apart from each other defining apertures therebetween and are generally aligned parallel to each other.
4. (original) The device of claim 1 wherein the index of refraction of the first transparent substrate is generally the same as the index of refraction of the second transparent substrate.
5. (original) The device of claim 4 wherein the first and second transparent substrates are constructed of a polymer.
6. (original) The device of claim 5 wherein the index of refraction of the wave guide structure is generally the same as the index of refraction of the exit control structure.
7. (original) The device of claim 6 wherein the index of refraction of the wave guide and exit control structures is less than the index of refraction of the first and second transparent substrates.
8. (original) The device of claim 7 wherein the wave guide and exit control structures are defined by voids in the first and second transparent substrates, respectively.
9. (original) The device of claim 8 wherein voids are filled with air.
10. (original) The device of claim 8 wherein voids are filled with a metal.
11. (original) The device of claim 1 wherein the plurality of wave guide structures each include a triangular cross-section having a base and a pair of sidewalls.

12. (original) The device of claim 11 wherein the plurality of exit control structures each include a truncated isosceles triangular cross-section having a major base, a minor base, and a pair of sidewalls.
13. (original) The device of claim 12 wherein the sidewalls of the wave guide structures are at an angle relative to the first surface of the first transparent substrate sufficient to reflect light striking the wave guide structure from the first direction.
14. (original) The device of claim 13 wherein the angle of each sidewall is between about 76 degrees and less than 90 degrees.
15. (original) The device of claim 11 wherein each of the plurality of wave guide structures have an aspect ratio of between about 2 and about 22.
16. (original) The device of claim 12 further comprising a reflective material provided on the minor base of the exit control structure having a truncated isosceles triangular cross-section.
17. (original) The device of claim 16 wherein the reflective material is configured to reflect light impinging thereon from a second direction opposite the first direction, and the plurality of collimating structures are configured to transmit light arriving from the first direction, wherein the sum of the percent of light being reflected relative to the light coming from the second direction, and the percent of light being transmitted relative to the amount of light coming from the first direction, is greater than 100 percent.

Claims 18-35 (cancelled)

36. (currently amended) A collimating device comprising:
a first transparent substrate having a first surface and a second surface;

a plurality of wave guide structures defined by voids in the first transparent substrate, each wave guide structure extending between and substantially bounded by the first surface and the second surface of the first transparent substrate ~~having a base associated with the first surface of the first transparent substrate;~~

a second transparent substrate having a first surface and a second surface; and

a plurality of exit control structures defined by voids in the second transparent substrate, ~~each exit control structure having a base associated with the first surface of the second transparent substrate;~~

wherein the first surface of the first transparent substrate and the first surface of the second transparent substrate face each other such that each wave guide structure is generally aligned with each exit control structure thereby forming a collimating structure,

wherein light emanating from a first direction facing the second surface of the first transparent substrate is collimated as it exits adjacent collimating structures.

37. (previously presented) The device of claim 36 wherein voids are filled with air.

38. (previously presented) The device of claim 36 wherein voids are filled with a metal.

39. (currently amended) A collimating device comprising:

a first transparent substrate having a first surface and a second surface;

a plurality of wave guide structures ~~provided in~~ extending between and bounded by the first surface and the second surface of the first transparent substrate, each wave guide structure having a base associated with the first surface of the first transparent substrate;

a second transparent substrate having a first surface and a second surface; and

a plurality of exit control structures provided in the second transparent substrate, each exit control structure having a base associated with the first surface of the second transparent substrate;

wherein the first surface of the first transparent substrate and the first surface of the second transparent substrate face each other such that each wave guide structure is generally aligned with each exit control structure thereby forming a collimating structure, wherein light emanating from a first direction facing the second surface of the first transparent substrate is collimated as it exits adjacent collimating structures.

40. (previously presented) The device of claim 39, wherein each respective base of the plurality of wave guide structures is contiguous with each respective base of the plurality of exit control structures.
41. (previously presented) The device of claim 39 wherein the plurality of exit control structures each include a truncated isosceles triangular cross-section having a major base, a minor base, and a pair of sidewalls.
42. (new) The device of claim 1, wherein each wave guide structure has a base associated with the first surface of the first transparent substrate and each exit control structure has a base associated with the first surface of the second transparent substrate.
43. (new) The device of claim 36, wherein each wave guide structure has a base associated with the first surface of the first transparent substrate and each exit control structure has a base associated with the first surface of the second transparent substrate.